Infurrow Product Comparison for Rhizoctonia

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Introduction: Rhizoctonia has a serious economic impact to sugar beet production in Southern Minnesota. Some cultural practices such as tiling and plant genetics have aided in combating this root disease, but in environments that are conducive to rhizoctonia additional tools are needed.

Objective: There are several products available to help control rhizoctonia in addition to the standard seed treatments. Quadris has been the product of choice for both infurrow and post emerge applications in recent years. The objective of this trial is to compare Quadris with other infurrow products available for rhizoctonia control.

Materials and Methods: A trial was conducted near Renville to compare several infurrow rhizoctonia products with and without a post-emerge Quadris application. The trial was planted on May 7th using Beta 9780. Normal agronomic practices were used to keep the trial free of weeds and non-rhizoctonia diseases. This trial was designed as a randomized complete block with four replications and eight treatments. Plots in this trial were six rows wide with the center 4 rows being treated and the center two rows being harvested for yield and quality analysis. The 8 leaf Quadris treatments were banded on June 22nd using a bike sprayer with 4001E nozzles with a spray volume of 10.75gpa. The plots were harvested on September 16th using a six row defoliator and a two row research lifter. The beets harvested from the center two rows were weighed on the lifter and a sample of those beets were used for a quality analysis at the tare lab. The data was analyzed for significance using SAS GLM version 9.4.

Results and Discussion: Although none of the parameters tested in this trial were statistically significant for individual treatments, there were some numerical trends in the data (Table 1). Analyzing the data using a linear contrast revealed a statistically significant increase in tons per acre and extractable sugar per acre between the treatments applied at planting compared to the treatments that banded Quadris at the 8-leaf stage in addition to the at planting applications (Table 2). This analysis did not find any statistically significant differences in the quality parameters between the treatments with and without the banded Quadris. The stand counts taken 28 days after planting (DAP) had very few differences and the 8 leaf Quadris treatment had not yet been applied (Table 3). However, the stand counts taken after the plots were defoliated for harvest showed a significantly higher stand for the three treatments that contained a seed treatment, infurrow product, and the 8-leaf banded Quadris compared to the seed treatment alone and the seed treatment plus the 8-leaf banded Quadris. Analyzing the data using a linear contrast showed a statistically significant increase in stand when Quadris was banded at the 8-leaf stage compared to no post application (Table 4).

Treatment	Percent Sugar	Tons PerAcre	Percent Extractable Sugar	Extractable Sugar per Ton (lbs.)	Extractable Sugar per Acre (lbs.)	Percent Purity
Seed Trt Alone	15.4	27.9	12.6	252.3	7028.1	89.0
Seed Trt plus Quadris Infurrow	15.1	29.1	12.5	249.3	7401.4	89.3
Seed Trt plus Xanthion Infurrow	15.0	30.5	12.3	245.5	7416.3	89.1
Seed Trt plus Elatus Infurrow	14.9	29.3	11.5	230.6	6783.1	85.9
Seed Trt Alone / 8 leaf Quadris	15.4	31.6	12.3	246.8	7787.8	87.8
Seed Trt plus Quadris Infurrow / 8 leaf Quadris	15.9	30.8	12.9	257.7	8468.5	88.8
Seed Trt plus Xanthion Infurrow / 8 leaf Quadris	15.2	32.8	12.5	249.7	8142.2	89.2
Seed Trt plus Elatus Infurrow / 8 leaf Quadris	14.4	30.7	11.6	231.6	6821.1	88.3
Mean	15.2	30.4	12.3	245.8	7474.0	88.4
CV%	2.9	9.4	4.2	4.2	9.9	2.0
Pr>F	0.2518	0.3008	0.0875	0.0904	0.1397	0.1811
lsd (0.05)	NS	NS	NS	NS	NS	NS

Table 1: Yield parameter results.

Treatment	Percent Sugar	Tons PerAcre	Percent Extractable Sugar	Extractable Sugar per Ton (lbs.)	Extractable Sugar per Acre (lbs.)	Percent Purity
At Planting Treatments	15.1	29.2	12.2	244.4	7157.2	88.3
At Planting Treatments with 8 leaf Quadris	15.2	31.5	12.3	246.4	7804.9	88.5
Mean	15.2	30.4	12.3	245.8	7474.0	88.4
CV%	2.9	9.4	4.2	4.2	9.9	2.0
Pr>F	0.4315	0.0252	0.5661	0.5730	0.0199	0.9231

Table 2: Yield parameter results between at planting treatments and at planting treatments with Quadris banded at the 8-leaf stage.

Treatment	28 DAP Stand Count per 100' row	PreHarvest Stand Count per 100' row
Seed Trt Alone	185 ab	144 c
Seed Trt plus Quadris Infurrow	200 a	155 bc
Seed Trt plus Xanthion Infurrow	180 ab	159 abc
Seed Trt plus Elatus Infurrow	204 a	162 abc
Seed Trt Alone / 8 leaf Quadris	165 b	154 c
Seed Trt plus Quadris Infurrow / 8 leaf Quadris	180 ab	175 ab
Seed Trt plus Xanthion Infurrow / 8 leaf Quadris	189 ab	173 ab
Seed Trt plus Elatus Infurrow / 8 leaf Quadris	195 a	175 a
Mean	187	162
CV%	8.9	8.2
Pr>F	0.0701	0.0279
lsd (0.05)	24.6	19.5

Table 3: Stand counts taken 28 days after planting and prior to harvest.

Treatment	28 DAP Stand Count per 100' row	PreHarvest Stand Count per 100' row
At Planting Treatments	192	155
At Planting Treatments with 8 leaf Quadris	182	169
Mean	187	162
CV%	8.9	8.2
Pr>F	0.1050	0.0072

Table 4: Stand count results between at planting treatments and at planting treatments with Quadris banded at the 8-leaf stage.

Conclusion: The addition of a banded 8-leaf Quadris application may improve the tons per acre and extractable sugar per acre even if an infurrow product or seed treatment was applied at planting. These treatments also improved plant stand at the end of the season. Some of the infurrow products also had a numerical increase in yield compared to the seed treatment alone. However, additional testing needs to be done to compare individual infurrow products.